

New Elective ME Course

1. Catalog Description:

A. Course Number, Title, Credits

ME-415; **Advanced Manufacturing Processes**, 3-0-3.

http://mechanical.njit.edu/docs/ME415_Adv-Manuf-Processes_S08.pdf

B. Prerequisites

ME-215, Engineering Materials and Processes; ME-316, Machine Design

C. Narrative Description

It is a new elective senior course taught at NJIT. The objective of this course is to introduce a physical phenomena, e.g. melting, solidification, solid deformation, impact, beam-target interaction, etc., which constitute the current manufacturing processes, and then to show how these phenomena are integrated in order to facilitate material purification, addition, removal, and modification.

The course will define a term “Advanced Manufacturing” and will introduce a notion of unit processes as building blocks of manufacturing technologies. A student will learn how the integration of known physical phenomena enables us to generate desired geometry, surface topography, composition and structure of a part brings about conversion of input materials into commercial products. The energy use and pollution generation as the basic process characteristics will be discussed too.

The course will include case studies of traditional technologies as well as such advanced processes solid free form fabrication, lithography, high energy rate processing, micro-forming, surface decontamination, etc. Advanced manufacturing technologies currently being developed by the Waterjet Technology laboratory will also be introduced. The study of parts fabrication using conventional technological materials such as metals, plastics, and ceramics will be supplemented by the examination of processing of the electronic and biomedical materials, food, etc. The efficiency of the energy utilization in the course of material processing will be addressed too. The common technological base of diverse manufacturing technologies will be addressed. While the generic fundamentals of the manufacturing technology will constitute the core of the course while numerous case studies will address specific technologies. The course will include lecture instruction and independent projects. Currently the manufacturing facilities available at NJIT will be used for process demonstration. At the later stages, when the needs of NJ industry will be accurately identified specialized laboratory faculties will be installed at NJIT and used for instruction.

INFORMATION:

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